

WHAT IS CLAIMED IS:

1. A stencil assembly for placing conductive elements over conductive pads provided at a first surface of a microelectronic element, said stencil assembly comprising:
  - 5 a main body having a top surface and a bottom surface and a plurality of openings extending between the top and bottom surfaces, said main body being adapted for overlying the first surface of said microelectronic element so that said openings are in substantial alignment with the pads accessible thereat;
  - 10 and
  - 15 a spacer element under the bottom surface of said main body, said spacer element being adapted for maintaining said main body above the first surface of said microelectronic element and remote from said pads.
- 15 2. The stencil assembly as claimed in claim 1, wherein said spacer element is attached to the bottom surface of said main body.
- 20 3. The stencil assembly as claimed in claim 2, wherein said spacer element includes one or more ribs extending along the bottom surface of said main body.
4. The stencil assembly as claimed in claim 3, wherein said ribs are integrally connected to and project from the bottom surface of said main body.
- 25 5. The stencil assembly as claimed in claim 1, wherein said spacer element includes a substantially flat plate adapted for lying between the bottom surface of the main body and a first surface of a microelectronic element.
- 30 6. The stencil assembly as claimed in claim 5, wherein the substantially flat plate of said spacer element includes one or more openings extending therethrough.
7. The stencil assembly as claimed in claim 1, wherein the top surface of said stencil and the first surface of said microelectronic element define a distance that is approximately equal to the diameter of said conductive elements, so that said

conductive elements do not substantially protrude over the top surface of said stencil when said conductive elements are over said pads.

8. The stencil assembly as claimed in claim 1, wherein said main body  
5 includes a substantially flat plate.

9. The stencil assembly as claimed in claim 8, wherein said substantially flat plate of said main body has a thickness of approximately 160-200 microns.

10 10. The stencil assembly as claimed in claim 1, further comprising a reservoir disposed over the top surface of said main body, said reservoir being adapted to retain said conductive elements remaining over the top surface of said main body after conductive elements have been deposited in the plurality of openings extending between the top and bottom surfaces of said main body.

15 11. The stencil assembly as claimed in claim 10, wherein said reservoir includes a central aperture extending therethrough, said central aperture defining side walls adapted for retaining said conductive elements over the top surface of said main body.

20 12. The stencil assembly as claimed in claim 1, wherein said microelectronic element includes a dielectric substrate.

25 13. The stencil assembly as claimed in claim 1, wherein said microelectronic element includes a printed circuit board.

14. An assembly comprising:  
a microelectronic element having a first surface and one or more  
30 terminals accessible at said first surface;  
a spacer plate having a top surface, a bottom surface and at least one opening extended therethrough secured over the first surface of said

microelectronic element, wherein said at least one opening of said spacer plate is in substantial alignment with said terminals;

5 a stencil having a top surface and a bottom surface and a plurality of openings extending therethrough secured over said spacer plate so that the plurality of openings in said stencil are in substantial alignment with said terminals, wherein said spacer plate holds said stencil remote from said terminals, and wherein conductive elements are deposited through the openings in said stencil so that each said deposited conductive element is affixed atop one of said terminals.

10 15. The assembly as claimed in claim 14, wherein the top surface of said conductive element stencil and the first surface of said microelectronic element define a distance that is approximately equal to the diameter of said conductive element so that said conductive elements do not substantially protrude over the top surface of said conductive element stencil when said conductive element stencil is positioned atop the first surface of said microelectronic element.

15 16. The assembly as claimed in claim 14, wherein said spacer plate includes a substantially flat plate that is disposed between the first surface of said microelectronic element and the bottom surface of said element stencil.

17. The assembly as claimed in claim 14, wherein said stencil has a thickness of approximately 160-200 microns

20 18. An assembly comprising:

a microelectronic element having a first surface and one or more terminals on said first surface, wherein a mass of flux material is deposited over each said terminal;

25 a spacer plate having a top surface, a bottom surface and at least one opening extending therethrough over the first surface of said microelectronic

element so that said at least one opening is in substantial alignment with said terminals; a stencil including a substantially flat plate having a top surface and a bottom surface and a plurality of openings extending between the top and bottom surfaces being secured over said spacer plate so that the plurality of said openings extending between the top and bottom surfaces being secured over said spacer plate so that the plurality of said openings in said stencil are in substantial alignment with said masses of flux material; and

5 a conductive element being deposited in each said opening in said stencil, wherein each said deposited conductive element is positioned atop one of  
10 said masses of flux material.

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